The limits of x are $ny=x_2$ and $n(c-y)=x_1$; of y, 0 and $\frac{1}{2}c$.

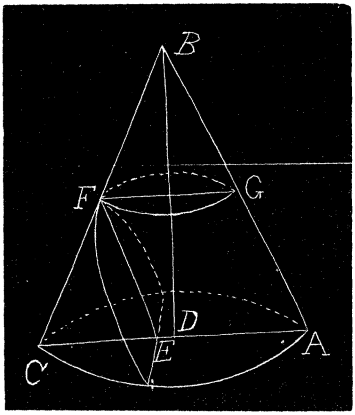
$$\therefore V=2\int_0^{\frac{1}{2}c}\int_{x_2}^{x_1}\sqrt{[n^2(c-y)^2-x^2]}\,dy\,dx$$

$$=\int_0^{\frac{1}{2}c}\{\tfrac{1}{2}\pi n^2(c-y)^2-n^2(c-y)^2\sin^{-1}\left(\frac{y}{c-y}\right)$$

$$-ny\sqrt{[n^2(c-y)^2-n^2y^2]}\}\,dy$$

$$=\tfrac{1}{6}\pi n^2c^3-\tfrac{2}{9}n^2c^3=\tfrac{1}{18}n^2c^3(3\pi-4)$$

$$=\tfrac{1}{18}R^2c(3\pi-4).$$



But $c=12$, $R=4$.

$\therefore V=32\pi-\frac{128}{3}$.

Volume of cone$=\frac{1}{3}\pi R^2c=64\pi$.

$\therefore$ Required vol.$=64\pi-(32\pi-\frac{128}{3})=32\pi+\frac{128}{3}$

$=143.1978$ cubic feet,

$=115.07$ bushels.

Also solved by *P. S. BERG* and *C. C. CROSS*.

[NOTE.—In the figure, the point E should coincide with D. ED. F.]

65. Proposed by F. P. MATZ, D. Sc., Ph. D., Professor of Mathematics and Astronomy, Irving College, Mechanicsburg, Pa.

Show that the path of a projectile moving with a constant velocity is an inverted catenary of equal strength.

No solution has yet been received.

PROBLEMS FOR SOLUTION.

ARITHMETIC.

102. Proposed by ALOIS F. KOVARIK, Professor of Mathematics, Decorah Institute, Decorah, Iowa.

A's age is to B's as 2:3. 20 years from now their ages will be to each other as 4:5. What are their ages, respectively ?

103. Proposed by WALTER H. DRANE, Graduate Student, Harvard University, 65 Hammond Street, Cambridge, Mass.

Find proceeds of a note discounted at a bank for 10 years at 10%. What is the meaning of the result ?

*** Solutions of these problems should be sent to B. F. Finkel not later than January 10.

ALGEBRA.

92. Proposed by ELMER SCHUYLER, High Bridge, N. J.

Given $x^2-yz=1$; $y^2-xz=2$; $z^2-xy=3$. Find x, y, and z.